



Ground Water

Engineering

Hydrocarbon

Remediation

Education

July 23, 1991

**VIA TELECOPIER**

Mr. Warren Smull  
Monsanto Company  
800 N. Lindbergh Boulevard - G4WM  
St. Louis, Missouri 63167

Re: Proposal for a Soil Boring Program in Sauget Sites-Area I at Dead Creek - Sector B, Site L, and Site M, Sauget, Illinois (Proposal No. 50212NY).

Dear Warren:

As requested, Geraghty & Miller, Inc. is providing this proposal for an investigation in Sauget Sites Area I at Dead Creek - Sector B, Site L, and Site M in Sauget, Illinois (Figure 1). The purpose of the study is to characterize conditions at the sites by determining the nature and extent of sediment/fill materials that may be present and estimate the volume of material that may be affected by organic compounds and metals.

To assess the feasibility of removal, it will be necessary to classify the material prior to disposal. Since these sites are not on Monsanto property, it is unlikely that the IEPA or USEPA would consider the soil or sediment at these sites as RCRA listed wastes. For RCRA "land ban" purposes, the material will probably be regarded as "soil and debris". Therefore, it is necessary to determine whether the sediment/fill is hazardous because of its characteristics and whether treatment will be required prior to disposal. Once the chemical nature of the sediment/fill material has been determined, which will be done in the first phase of the project, a small number of additional soil samples will be selected during a second phase of fieldwork (1 day) which will be tested for hazardous characteristics. Each of these samples will be analyzed for reactivity, corrosivity, ignitability, and the list of constituents which are analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) (Table 1). The results from these analyses will be used to determine whether the sediment/fill is a hazardous waste and whether it needs to be treated prior to disposal.

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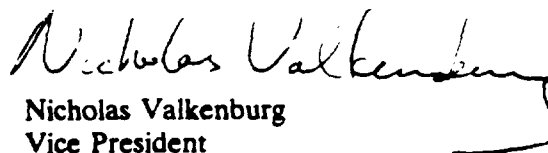
We have revised the list of parameters for soil analysis from our previous proposal based on our review of the Dead Creek - Sector A report submitted to the IEPA by Cerro Copper Products Company. Cerro chose to analyze all samples for PCBs, PCB precursors, and RCRA metals and selected samples for Appendix IX compounds, metals, EP Toxicity, reactivity, corrosivity, and ignitability. We specified the USEPA TCL/TAL parameters for selected samples because the areas of investigation are not RCRA facilities. The remainder of the samples have been proposed for either PCBs, metals, or VOCs. In addition, we have adjusted our boring locations from our September 1990 proposal based on the work conducted in Sector A.

If you have any questions or if you require any additional information, please call us.

Sincerely,

GERAGHTY & MILLER, INC.

  
Dennis Colton  
Project Officer

  
Nicholas Valkenburg  
Vice President

DC/NV:ml  
Small, Jr.

MCA 0157009

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**SCOPE OF WORK  
FOR A SOIL BORING PROGRAM  
SELECTED SAUGET SITES - AREA I  
SAUGET, ILLINOIS**

**INTRODUCTION**

This proposal includes a scope of work for three selected sites in the area designated by the Illinois Environmental Protection Agency (IEPA) as Sauget Sites - Area I (Figure 1). These three sites are Dead Creek - Sector B, Site L, and Site M; however, access is not available in a small area in the northwestern portion of Dead Creek - Sector B. The purpose of the investigation is to characterize the sites by determining the nature and extent of sediment/fill materials in the unsaturated zone in Sector B and Site L and below the pond at Site M. This will be accomplished through the analysis of selected sediment/fill samples for the USEPA Target Compound List/Target Analyte List (TCL/TAL) and through analysis of the remaining samples for site specific compounds, such as PCBs, TAL metals, or TAL volatile organic compounds (VOCs). Once the nature and extent of the sediment/fill has been delineated, selected areas that best represent site conditions will be sampled and analyzed for reactivity, corrosivity, ignitability, and the list of constituents which are analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) provided in Table 1.

The results from these analyses will be used to determine whether the fill or sediment is a hazardous waste and whether it needs to be treated prior to disposal. The number of samples scheduled for TCLP analysis will be based on the Phase I results, however, it is anticipated that only a limited number of samples (about five) will be required.

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### **SOIL BORING PROGRAMS**

Boring programs will be conducted in the Sauget Sites - Area I project area at Dead Creek - Sector B, and at Sites L and M (Figure 1). A description of past studies and proposed work for each site is presented below.

#### **Dead Creek - Sector B**

Dead Creek - Sector B is located between Queeny Avenue and Judith Lane. The culverts at both ends for Sector B have been sealed to prevent inflow or outflow from this area. The banks of the creek are heavily vegetated and debris is visible in the area. The site is enclosed within a chain-line fence without a gate. In general, the creek area consists of a narrow channel about 5 feet wide which is flanked by a low bank on either side. The channel and low banks are enclosed by steeper banks on either side of the creek. Precipitation that collects in the creek recharges the ground water below.

In 1980, the IEPA conducted a study at Dead Creek which included the installation of monitoring wells and borings, and the collection of surface water, ground water and soil samples. A vertical profile of the creek sediments in the northern portion of Sector B and soil samples collected at 17 other locations indicate the presence of mostly metals and PCBs with some other organic compounds present.

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In 1987, Ecology & Environment, Inc. (E&E) conducted a remedial investigation (RI) for the IEPA at all of the Sauget sites, some of which are not shown on Figure 1. In Sector B, E&E collected two surface water samples and five sediment samples; however, the sampling locations were restricted to the north and south ends of the study area. The data from these sampling points indicate that past uses of the creek have impacted the site. Constituents detected included metals and PCBs.

The existing data are not sufficient to determine the extent of the sediment/fill, nor will it satisfy the requirements for a characteristic waste determination. Therefore, we propose to collect soil samples across ten profiles within the creek bed, spaced approximately 200 feet apart, throughout the 2,000-foot length of Sector B. Three borings are proposed for each profile, as shown on Figure 2, similar to the study conducted in Sector A. All borings will be drilled to determine the thickness of the sediment/fill in the creek and will be spaced 15 to 20 feet apart. It is anticipated that the borings within the creek bed will be drilled to a maximum depth of about seven feet. Samples will be collected using a 5-foot continuous tube sampler, and 3-inch diameter split spoons will be used if recovery is poor in the fine sandy sediments. Both methods will provide a continuous record of the geology, as well as a sufficient volume of material for analysis. All samples will be described by a Geraghty & Miller field geologist who will record sample location, depth, grain size distribution, and color. Each sample will also be screened in the field for the presence of VOCs using a photoionization detection (PID) instrument.

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We propose to select one sediment/fill samples per borehole for chemical analysis based on appearance, odor, and PID measurements. Each sample will be selected from a 2-foot interval that best characterizes sediment/fill in the creek. One sediment/fill sample per profile will be analyzed for USEPA TCL/TAL parameters. The remainder of the samples will be analyzed for TAL metals and PCBs. Appropriate QA/QC samples will also be collected. The analytical data from the sediment/fill will be used to delineate any impacted areas as well as provide an estimate of the volume of sediment/fill that may require remediation. Each borehole will be sealed with a mixture of drill cuttings and bentonite grout and the borehole's location and land surface elevation will be surveyed by a licensed land surveyor. All drilling equipment will be steam cleaned after each borehole and all sampling equipment will be decontaminated with a laboratory grade detergent and potable water before the collection of each sample.

At present, we propose to use an all-terrain vehicle (ATV) drill rig for the entire program. However, in some areas it may be necessary to pump off standing water in some areas to provide suitable sampling conditions. Assuming that the water can be pumped to a sewer and an access point is relatively near, direct pumping is recommended. Alternatively, if a direct discharge is not possible, we could start the boring program and work up to the area where the standing water is located, then transfer the water into the area of the creek where the boring program has been completed. If there is too much water to transfer, the drill rig can be mounted on a reinforced aluminum pontoon that can be anchored to the creek channel bank with steel cables. This drilling method was used in

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Seal  
bores  
before pumping  
begins

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portions of Sector A. In addition, a gate will have to be installed within Sector B's chain-link perimeter fence to provide access for the drill rig and field crew.

Site L

Site L is located on the east side of Dead Creek, approximately 700 feet south of Queeny Avenue. It is a former location of a surface impoundment used by a hazardous waste hauler who disposed of wash water from truck cleaning operations. Site L was determined by E&E to be approximately 70 feet by 150 feet and located about 125 feet east of Dead Creek. Currently, the site is covered with black cinders and is used for equipment storage by Metro Construction Equipment Company. Waste material is not visible at the surface and access to the site is not controlled. Surficial soil was not sampled by E&E; however, the site is covered with cinder material.

In 1987, E&E installed a shallow well, drilled three soil borings, and conducted a soil-gas survey at Site L. The data from these sampling points indicates that past activities have impacted soils and ground water at the site. Compounds detected include benzene, toluene, phenols and arsenic. No PCBs were detected. In 1980, the IEPA installed a well downgradient of this area; however, due to its construction, it was replaced and sampled by E&E during the 1987 investigation.

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To define the lateral and vertical extent of the fill material in this area, additional soil borings are required. Previous soil sampling programs conducted by E&E in 1987 consisted of composite sampling over zones of 5 to 10 feet thick, which were not consistent from boring to boring, and also included both saturated and unsaturated soil in the same composite sample. The existing data are not sufficient to determine the extent of the fill material in this area. Since this site is relatively small (70 feet by 150 feet), only six borings are necessary and will be installed using a 50-foot grid spacing to supplement the existing borings installed during the E&E investigation.

At each boring location, we propose to collect continuous samples to delineate the bottom of the fill using a continuous 5-foot tube sampler or a 3-inch diameter split-spoon, as previously described. One sample will be submitted for laboratory analysis per borehole that best characterizes the fill material. Each sample will be limited to a 2-foot section of the continuous core and the intervals selected for analysis will be based on appearance, odor, and PID readings. At two of the six borings, the samples will be analyzed for TCL/TAL parameters. At the remaining four borings, PCBs, TAL, metals, and VOCs have been selected for analysis, based on existing data, to determine the chemical nature of the fill material. Each borehole will be sealed and surveyed as described for Dead Creek - Sector B.

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Site M

Site M is a former sand and gravel pit excavated between 1945 and 1950. The pit is approximately 275 feet by 300 feet and is filled with water. E&E estimated the pit's depth to be 40 feet. Site M is connected to Dead Creek - Sector B at the southwest corner of Site M; however, it is not known whether Site M was excavated into the water table. This probably was the case since water is present in the pit year round. Other than miscellaneous trash, no other waste disposal was evident in the pit at the time of the E&E study. Access to the site is controlled by a chain-link fence.

In 1987, E&E collected two surface water samples and five sediment samples from the pit, and soil-gas samples were collected from the pit's banks, although it is not clear where the sediment samples were collected. It appears that the sediment samples were collected from the pit perimeter based on the location map. The data from these sampling points indicates that past site activities may have impacted the area. The surface-water samples were not contaminated, however, the sediment data indicate some impact from previous site use may have occurred, based on PCB results up to 28.8 parts per million (ppm). In 1980, the IEPA collected two, unfiltered, surface-water samples and PCBs were also detected (4.4 ppm and 0.9 ppm).

The existing data are not sufficient to determine the extent of the impacted sediment, nor will it satisfy the requirements for a characteristic waste determination. Therefore, we

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propose to collect sediment samples from three locations from beneath the ponded water using a soil boring drill rig supported by the aluminum pontoon previously described. This method of supporting a drill rig on surface water has been used successfully at other sites. Sediment samples will be collected using a split-spoon sampler. One sample for laboratory analysis will be selected from each of the three locations at the 0 to 2-foot interval. At one location, the sample will be analyzed for TCL/TAL parameters, and at the other two locations, each sample will be analyzed for PCBs and TAL metals. For costing purposes, we will assume that the pit bottom is at a maximum distance of 10 feet below the pond level. Sample selection protocols and decontamination procedures will be the same as was described for Dead Creek - Sector B.

#### **PHASE II FIELD WORK**

Once the chemical nature of the sediment/fill material has been determined, a small number of additional samples will be selected during a second phase of fieldwork, probably one day, which will be collected for hazardous characteristics. We anticipate that no more than five samples will be required to classify the material. Each of these samples will be analyzed for reactivity, corrosivity, ignitability, and the list of constituents which are analyzed by the TCLP (Table 1). The results of these analyses will be used to determine whether the sediment/fill material is a hazardous waste and whether it needs treatment prior to disposal.

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### **DATA VALIDATION**

It does not appear that the Dead Creek - Sector A data was validated during Cerro's study. We propose to validate 10 percent of the samples according to the USEPA's "Data Reference Validation Functional Guidelines," and screen the remaining samples for completeness and technical compliance. The screening procedure requires much less time to complete. However, the laboratory could provide a CLP data package for all samples for possible future data validation, if required. The information to be screened would include:

- Check to see if the field chain-of-custody form was filled out and if samples were logged in properly.
- Review internal quality assurance/quality control (QA/QC) data. Make sure duplicates, blanks, and spikes were analyzed on the minimum number of samples as specified in the QAPP.
- Review all blank/duplicate data. If target compounds appear in blanks or if percent relative difference on duplicates is outside established limits, the reasons for these anomalies will be investigated. In such an event, sampling techniques will be discussed with the project manager and/or the lab manager and internal QA/QC data will be reviewed as appropriate.

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- Check to see if holding times were met for each parameter.
- Check to see if parameters were analyzed by the methods identified in the QAPP.
- If data appears suspect, the specific data of concern will be investigated. Calculations will be traced back to the raw data. If the calculations did not agree with the prescribed limits, the cause will be determined and corrected, if possible.

#### **WORK PLAN DEVELOPMENT/COST ESTIMATE**

Prior to the start of the field investigation, Geraghty & Miller will develop the necessary work plans including a Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), and Health and Safety Plan (HASP). It should be possible to prepare these documents within three weeks after receiving authorization to proceed.

Estimated costs for the project are provided in Table 2 which includes costs for preparing the work plans, completing the field investigation, and preparing a report detailing the sampling and analytical program. The estimates assume that the work can be completed in level D protective equipment. We have also assumed that the field geologists will be supplied by our St. Louis office to minimize travel and expense costs.

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If you have any questions or require additional information, please do not hesitate to call us.

Sincerely,

GERAGHTY & MILLER, INC.



Dennis Colton  
Project Officer



Nicholas Valkenburg  
Vice President



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Sent: 1/1/00

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Table 1. Federal Toxicity Characteristic Constituents and Regulatory Levels

METALS	
CONSTITUENT	REGULATORY LIMIT* (mg/L)
Arsenic	5.0
Barium	100.0
Cadmium	1.0
Chromium	5.0
Lead	5.0
Mercury	0.2
Selenium	1.0
Silver	5.0

VOLATILE ORGANICS	
CONSTITUENT	REGULATORY LIMIT* (mg/L)
Benzene	0.5
Carbon tetrachloride	0.5
Chlorobenzene	100.0
Chloroform	6.0
1,4-Dichlorobenzene	7.5
1,2-Dichloroethane	0.5
1,1-Dichloroethylene	0.7
Methyl ethyl ketone	200.0
Tetrachloroethylene	0.7
Trichloroethylene	0.5
Vinyl chloride	0.2

\*Federal Register, March 29, 1990

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Table 1. Federal Toxicity Characteristic Constituents and Regulatory Levels

**SEMIVOLATILES**

CONSTITUENT	REGULATORY LIMIT* (mg/L)
o-Cresol	200.0
m-Cresol	200.0
p-Cresol	200.0
Cresol (total)	200.0
2,4-Dinitrotoluene	0.13
Hexachlorobenzene	0.13
Hexachloro-1,3-butadiene	0.5
Hexachloroethane	3.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
Pyridine	5.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0

**PESTICIDES/HERBICIDES**

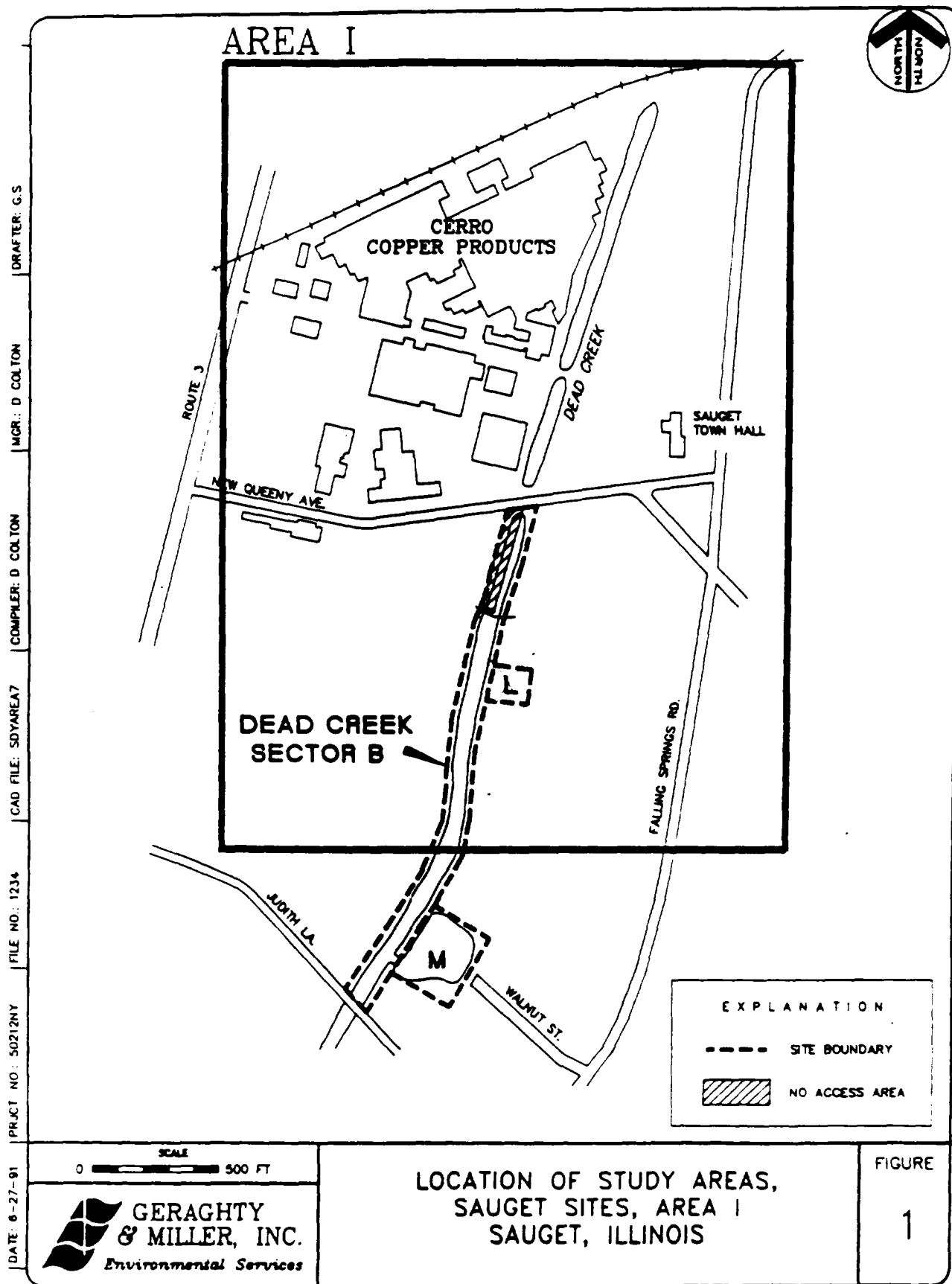
CONSTITUENT	REGULATORY LIMIT* (mg/L)
Chlordane	0.03
2,4-D	10.0
Endrin	0.02
Heptachor (and its hydroxide)	0.008
Lindane	0.4
Methoxychlor	10.0
Toxaphene	0.5
2,4,5-TP (Silvex)	1.0

\*Federal Register, March 29, 1990

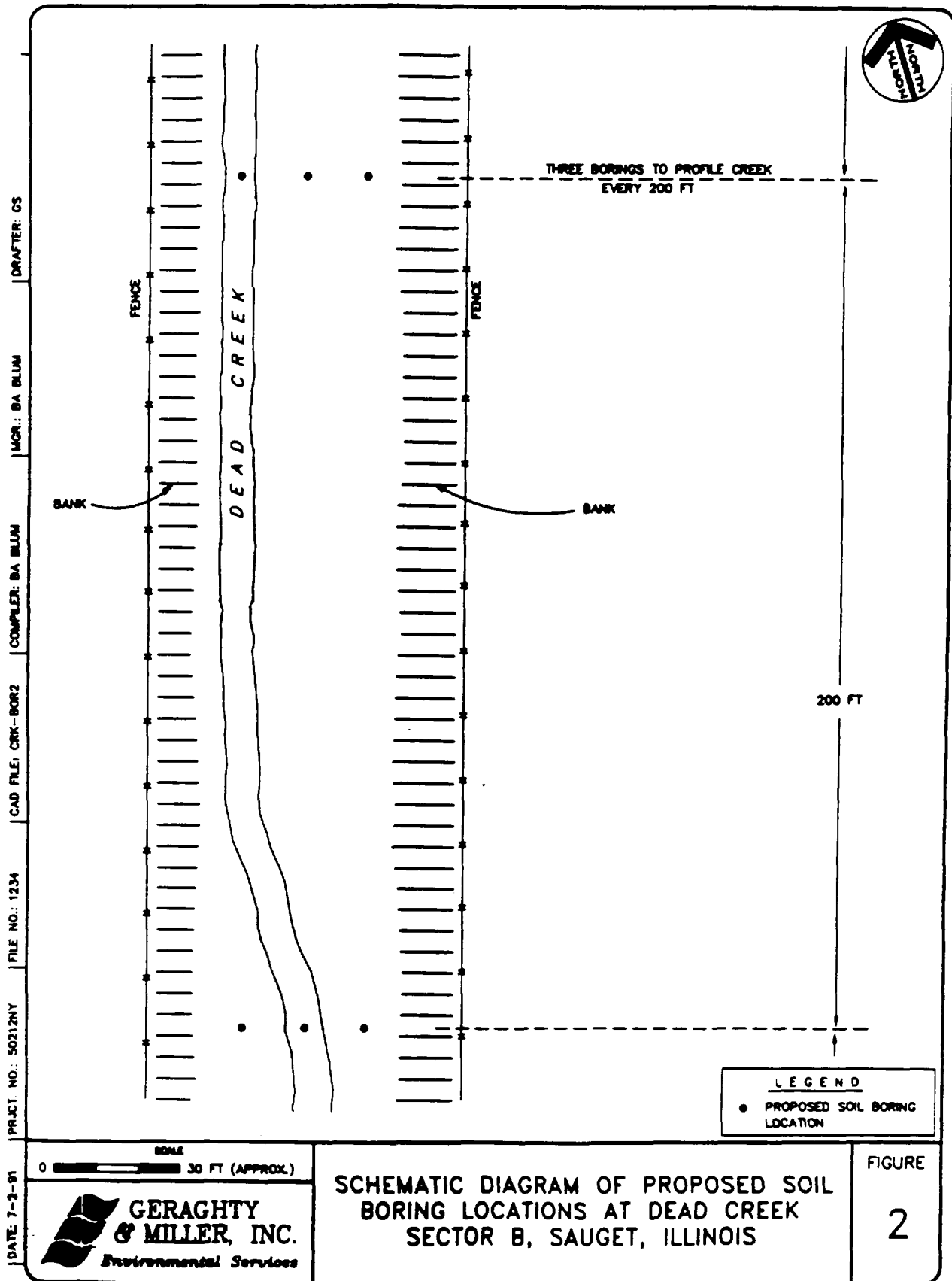
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Table 2. Cost Estimate for a Soil Boring Program at Dead Creek - Sector B, Site L, and Site M at Sauget Sites - Area I, Monsanto Company, Sauget, Illinois.

Page 1 of 2

		Task 1 Prepare Work Plan, FSP, QAPP, HASP	Task 2 Dead Creek - Sector B Field Investigation	Task 3 Site L Field Investigation	Task 4 Site M Field Investigation	Task 5 Phase II Field work	Task 6 Data Validation	Task 7 Data Evaluation	Task 8 Report Preparation	Total Hours	Total Costs
<b>LABOR</b>											
Senior Project Advisor	\$135	24	16	2	3	2	12	8	24	91	\$12,285
Principal: Scientist II/Engineer II	\$110	-	-	-	-	-	-	-	-	-	\$0
Principal: Scientist I/Engineer I	\$105	8	-	-	-	-	-	-	-	8	\$840
Senior: Scientist II/Engineer II	\$98	60	32	3	5	2	16	24	60	202	\$19,796
Senior: Scientist I/Engineer I	\$90	-	-	-	-	-	-	-	-	-	\$0
Project: Scientist II/Engineer II	\$84	-	-	-	-	-	-	-	-	-	\$0
Project: Scientist I/Engineer I	\$79	-	-	-	-	-	-	-	-	-	\$0
Staff: Scientist II/Engineer II	\$75	-	-	-	-	-	60	-	-	60	\$4,500
Staff: Scientist I/Engineer I	\$70	60	60	20	30	12	60	24	60	326	\$22,820
Scientist III/Engineer III	\$63	-	-	-	-	-	-	-	-	-	\$0
Scientist II/Engineer II	\$55	10	-	-	-	-	-	-	-	10	\$550
System Designer	\$53	-	-	-	-	-	-	-	-	-	\$0
Staff Technician II	\$48	-	-	-	-	-	-	-	-	-	\$0
Scientist I/Engineer I	\$44	-	-	-	-	-	-	-	-	-	\$0
Staff Technician I	\$40	-	-	-	-	-	-	-	-	-	\$0
Technician	\$34	-	-	-	-	-	-	-	-	-	\$0
Technical Editor	\$52	8	-	-	-	-	-	-	8	16	\$832
Senior Draftsperson	\$52	-	-	-	-	-	-	-	-	-	\$0
Draftsperson	\$40	8	-	-	-	-	-	-	16	24	\$960
Research Assistant	\$37	-	-	-	-	-	-	-	-	-	\$0
Admin. Support/Clerical	\$32	24	8	2	2	2	3	4	24	69	\$2,208
<b>TOTAL HOURS</b>		<b>202</b>	<b>116</b>	<b>27</b>	<b>40</b>	<b>18</b>	<b>151</b>	<b>60</b>	<b>192</b>	<b>806</b>	
<b>LABOR SUBTOTAL</b>		<b>\$16,214</b>	<b>\$9,752</b>	<b>\$2,028</b>	<b>\$3,059</b>	<b>\$1,370</b>	<b>\$11,984</b>	<b>\$5,240</b>	<b>\$15,144</b>		<b>\$64,791</b>
<b>EXPENSES</b>											
Communications/Shipping	250	2,500	500	400	500	50	-	-	250		\$4,450
Meals and Hotel	-	120	30	45	15	-	-	-	-		\$210
Transportation	-	1,500	100	150	50	-	-	-	-		\$1,800
Copying	250	25	5	5	5	50	-	-	250		\$590
Other	-	-	-	-	-	-	-	-	-		\$0
<b>SUBTOTAL EXPENSES</b>		<b>\$500</b>	<b>\$4,145</b>	<b>\$635</b>	<b>\$600</b>	<b>\$570</b>	<b>\$100</b>	<b>\$0</b>	<b>\$500</b>		<b>\$7,050</b>
<b>MARK UP</b>	-	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		<b>\$0</b>
<b>TOTAL EXPENSES</b>		<b>\$500</b>	<b>\$4,145</b>	<b>\$635</b>	<b>\$600</b>	<b>\$570</b>	<b>\$100</b>	<b>\$0</b>	<b>\$500</b>		<b>\$7,050</b>

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Protected Material: Monsanto Insurance Coverage Litigation

Table 2: Cost Estimate for a Soil Boring Program at Dead Creek - Sector B, Site L, and Site M at Saugat Sites - Area I, Monsanto Company, Saugat, Illinois.

	Task 1		Task 2		Task 3		Task 4		Task 5		Task 6		Task 7		Task 8		Total Costs
	Prepare Work Plan, FSP, OAPP, HASP	Dead Creek - Sector B Field Investigation	Site L Field Investigation	Site M Field Investigation	Site L Field Investigation	Site M Field Investigation	Field work Phase II	Validation	Data Evaluation	Report Preparation							
<b>EQUIPMENT</b>																	
Computer Equipment	100	75	25	25	25	25	25	100	100	100	400						\$850
Safety Equipment	-	300	60	30	30	30	30	-	-	-	-						\$480
Field Instruments	-	600	200	300	300	300	100	-	-	-	-						\$1,200
Sampling Van & Mileage	-	-	-	-	-	-	-	-	-	-	-						\$0
Supplies	-	200	25	50	25	50	25	-	-	-	-						\$300
Other	-	-	-	-	-	-	-	-	-	-	-						\$0
<b>SUBTOTAL EQUIPMENT</b>	<b>\$100</b>	<b>\$1,175</b>	<b>\$310</b>	<b>\$465</b>	<b>\$180</b>	<b>\$100</b>	<b>\$100</b>	<b>\$400</b>	<b>\$100</b>	<b>\$100</b>	<b>\$400</b>						<b>\$2,830</b>
MARK UP	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0						\$0
<b>TOTAL EQUIPMENT</b>	<b>\$100</b>	<b>\$1,175</b>	<b>\$310</b>	<b>\$465</b>	<b>\$180</b>	<b>\$100</b>	<b>\$100</b>	<b>\$400</b>	<b>\$100</b>	<b>\$100</b>	<b>\$400</b>						<b>\$2,830</b>
<b>SUBCONTRACTOR COSTS</b>																	
Driller	-	12,000	3,000	7,000	1,500	-	-	-	-	-	-						\$23,500
Surveyor	-	1,500	200	200	-	-	-	-	-	-	-						\$1,900
Laboratory	-	42,000	12,500	7,000	8,000	-	-	-	-	-	-						\$69,500
Other	-	-	-	-	-	-	-	-	-	-	-						\$0
<b>SUBTOTAL SUBCONTRACTOR</b>	<b>\$0</b>	<b>\$55,500</b>	<b>\$15,700</b>	<b>\$14,200</b>	<b>\$9,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>						<b>\$94,900</b>
MARK UP	5%	\$2,775	\$785	\$710	\$0	\$0	\$0	\$0	\$0	\$0	\$0						\$4,745
<b>TOTAL SUBCONTRACTOR COSTS</b>	<b>\$0</b>	<b>\$58,275</b>	<b>\$16,485</b>	<b>\$14,910</b>	<b>\$9,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>						<b>\$99,645</b>
<b>TOTAL EXPENSES, EQUIPMENT &amp; SUBCONTRACTOR SUBTOTAL</b>																	
<b>GRAND TOTAL</b>	<b>\$16,814</b>	<b>\$73,347</b>	<b>\$19,458</b>	<b>\$19,034</b>	<b>\$11,820</b>	<b>\$12,184</b>	<b>\$5,340</b>	<b>\$16,044</b>	<b>\$174,316</b>								

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